

COUNTY ROAD 11 SAFETY STUDY

SHELBY COUNTY, ALABAMA



PREPARED FOR:

THE CITY OF PELHAM

SHELBY COUNTY HIGHWAY DEPARTMENT

THE REGIONAL PLANNING COMMISSION
OF GREATER BIRMINGHAM

PREPARED BY:

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COUNTY ROAD 11 SAFETY STUDY

SHELBY COUNTY, ALABAMA

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Introduction

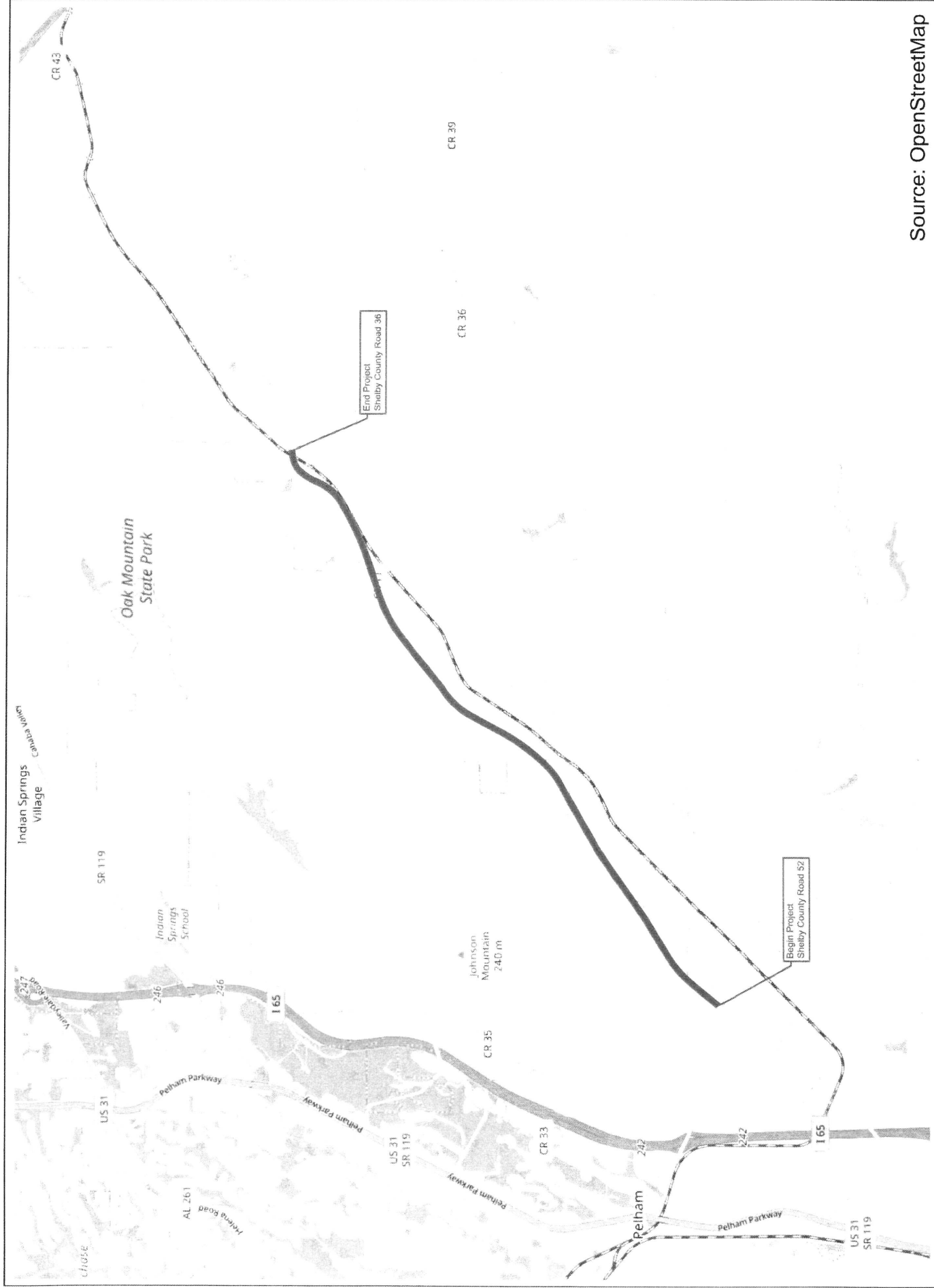
The purpose of this report is to document a roadway traffic safety evaluation that has been conducted for Shelby County Highway 11 in Shelby County, Alabama. The City of Pelham, Shelby County, and the Regional Planning Commission of Greater Birmingham have identified the Shelby County Highway 11 roadway corridor as a location for an evaluation of roadway safety performance and characteristics. This study effort has been conducted to accomplish the following objectives:

- to review/examine the existing roadway conditions within the study area;
- to review/examine the existing crash data within the study area;
- to review/examine existing crash patterns present within the study area;
- to identify safety enhancements and countermeasures to address existing conditions;
- to test and evaluate any safety enhancements and countermeasures; and
- to make recommendations of potential safety enhancements and countermeasures to be implemented within the study area.

Sources of information used in this report include: The Institute of Transportation Engineers; the Transportation Research Board; the Alabama Department of Transportation; Shelby County, Alabama; the City of Pelham, Alabama; the Regional Planning Commission of Greater Birmingham; and field reconnaissance efforts and other information collected by Skipper Consulting, Inc.

Study Area & Project Limits

The subject of this project is Shelby County Highway 11 in Shelby County, Alabama. The specific limits of this study effort begin at the intersection of Shelby County Highway 11 and Shelby County Highway 52 in Pelham, Alabama and continues north to the intersection of Shelby County Highway 11 and Shelby County Highway 36 in Shelby County, Alabama. Figure 1 notes the location of the study area and its relationship to adjacent area roadways.



Source: OpenStreetMap

Scale: Not to Scale
Date: MAR 2021



Figure 1 - Site Location Map
County Road 11 Safety Study
Shelby County, Alabama

Existing Roadway Conditions

Currently, Shelby County Highway 11 is a two-lane minor arterial roadway. The existing pavement width is 28 feet wide with 12 foot wide lanes and 2 foot paved shoulders. The roadway was first constructed in 1958 and was last resurfaced in 2005. Figures 2 and 3 illustrate the typical roadway section within the project limits.



Figure 2 – Typical Roadway Cross Section – Shelby County Highway 11



Figure 3 – Typical Roadway Cross Section – Shelby County Highway 11

Existing Traffic Volume Data

According to the Alabama Department of Transportation's traffic monitoring department, traffic volumes along Highway 11 vary from 10,863 to 13,482 depending on the location within the study limits. The study area was divided into segments with similar lengths, roadway characteristics, and traffic volumes. Figure 3 illustrates the roadway segments and the traffic data locations. It is assumed that Segment B would be a transitional segment with traffic volumes between those measured in Segments A&C. Also, there is an additional traffic data location just north of the study area that shows a similar traffic volume to Segment C.

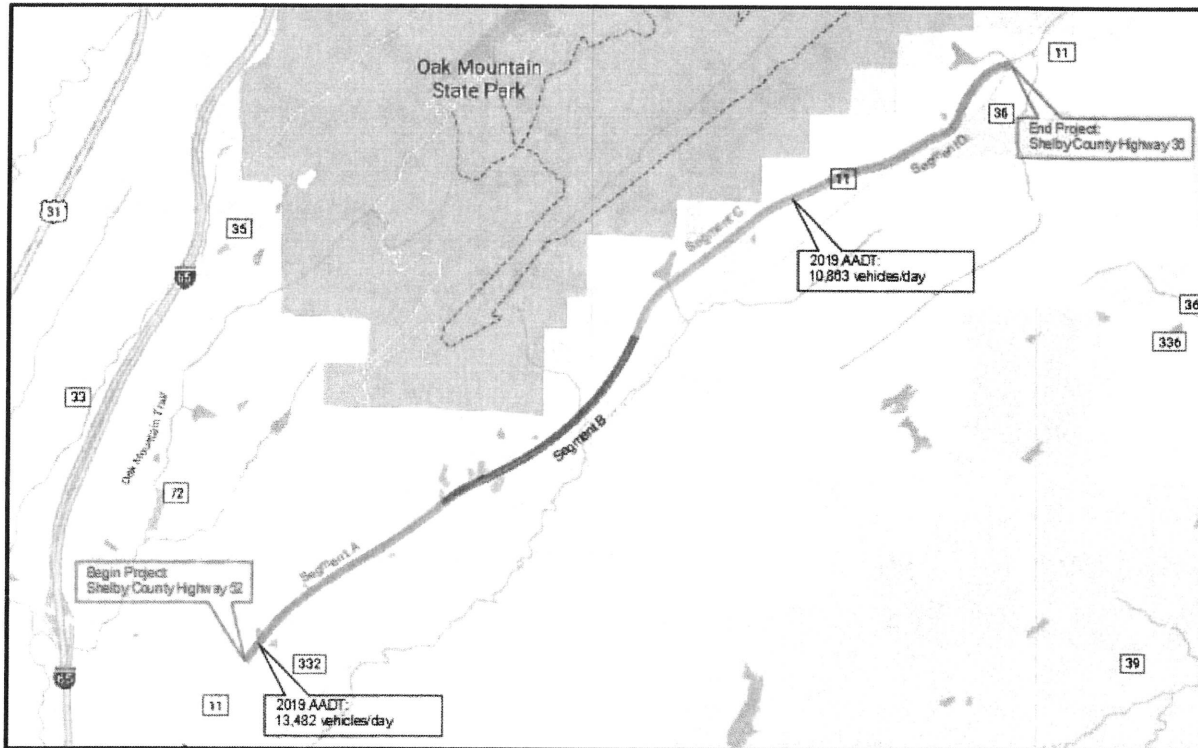


Figure 4 – Existing Traffic Data – Shelby County Highway 11

Crash Analysis

Existing Crash Data Screening

Overall Statistical Data

Existing crash data was screened to determine the existing crash experience within the study area. As a screening method to determine crash hotspots, the roadway crash data taken from the CARE system was provided by Shelby County. The latest crash data from the years 2015-2019 were considered as the initial screening process. Table 1 illustrates the total number of crashes and severity recorded in the CARE system from 2015-2019.

<i>Table 1 – Total Crash Experience – Shelby County Highway 11 from Highway 52 to 36</i>						
Total Crashes by Severity – Shelby County Highway 11 from Highway 52 to Highway 36						
Year	Crash Severity					Total
	K	A	B	C	O	
2015	1	1	2	1	14	19
2016	0	1	1	1	15	18
2017	0	1	1	1	17	20
2018	0	1	1	1	19	22
2019	1	3	1	2	16	23
Totals	2	7	6	6	81	102

The crash severity illustrated in Table 1 uses the KABCO scale. The KABCO scale is a scale for injury severity that was developed by the National Safety Council (NSC) and is commonly used by law enforcement for classifying injuries. The KABCO scale is as follows:

K	Fatal Injury
A	Incapacitating Injury
B	Nonincapacitating Injury
C	Possible Injury
O	No Injury

As illustrated in Table 1, the crash experience along the study roadway is mostly evenly distributed over each year from 2015-2019. Note that a full year crash data was not available for 2020 at the time of this study effort, so 2020 crash data was not considered. Based upon the crash data as reported, 2019 was selected for the year for a more detailed analysis. 2019 appears to have one of the higher crash exposures with a more severe crash experience.

Roadway Segment/Location Screening

The final screening procedure used to analyze the crash experience within the study area was to determine the hotspot locations along the roadway where the crashes are occurring. Shelby County Highway 11 is not a mileposted route, so the crash data was located within the study area using the longitude and latitude coordinates provided in the CARE data.

Table 2 illustrates the crashes by roadway segment as recorded in CARE.

<i>Table 2 – Crashes by Roadway Segment – Shelby County Highway 11 from Highway 52 to 36</i>							
Segment	2019 AADT	Yearly Crashes					Total
		2015	2016	2017	2018	2019	
Segment A – Highway 52 to Chatham Court	13,482	12	5	12	10	18	57
Segment B – Chatham Court to Woodridge Circle	12,172*	6	7	7	9	1	30
Segment C – Woodridge Circle to Grey Oaks Parkway	10,863	1	4	1	1	4	11
Segment D – Grey Oaks Parkway to Highway 36	10,668	0	2	0	2	0	4

As noted in Table 2, the segments with the highest crash experience are the segments from Highway 52 to Woodridge Circle. These segments are also the segments with the higher traffic volumes which would indicate they have a higher exposure rate for crashes. Based upon the crash experience within segments A&B, it was determined they would be the focus area for a further in-depth analysis.

Crash Characteristics Analysis

To further screen the crash data, an analysis of the overall crash conditions was completed. The environmental conditions as well as the crash type and most harmful event were analyzed. This was done as a method to better identify potential patterns in the crash experience recorded. Table 3 provides the results of the crash analyses.

Table 3 – Crash Characteristics Screening						
	Yearly Crashes					Totals
	2015	2016	2017	2018	2019	
Weather Conditions						
Clear	12	12	10	9	11	55 (53%)
Cloudy	4	4	8	8	4	28 (27%)
Mist	1	2	0	0	1	4 (4%)
Fog	0	0	1	0	1	2 (2%)
Rain	2	0	1	5	6	14 (14%)
Pavement Conditions						
Dry	16	17	19	14	14	80 (78%)
Wet	3	1	1	8	9	22 (22%)
Lighting Conditions						
Dawn	1	0	1	0	1	3 (3%)
Daylight	11	14	17	17	16	75 (73%)
Dusk	3	1	1	0	1	6 (6%)
Dark	4	3	1	5	5	18 (18%)

Table 3 – Crash Characteristics Screening (Continued)						
	Yearly Crashes					Totals
	2015	2016	2017	2018	2019	
Cause of Crash						
Distracted	4	3	5	4	2	18 (17%)
DUI	0	0	0	2	1	3 (3%)
Crossed Centerline	3	0	1	0	2	6 (6%)
Failed to Yield ROW	2	0	3	3	6	14 (13%)
Ran off Road	1	2	2	2	2	9 (9%)
Follow too Close	3	2	4	2	2	13 (13%)
Misjudge Stopping Distance	2	2	1	1	2	8 (8%)
Swerved to Miss Vehicle	0	3	0	0	0	3 (3%)
Improper Passing	0	0	0	0	1	1 (1%)
Driving too Fast	0	0	0	4	2	6 (6%)
Unseen Object	1	3	1	3	1	9 (9%)
Other	3	3	3	1	2	12 (12%)
Crash Type						
Angle Crash	2	2	3	2	5	14 (14%)
Roadway Departure	5	3	2	5	4	19 (18%)
Rear End	6	7	9	8	7	37 (36%)
Side Impact (90 degree)	4	1	2	2	3	12 (12%)
Sideswipe	2	2	2	1	1	8 (8%)
Hit Object	0	3	1	2	1	7 (7%)
Other	0	0	0	2	0	2 (2%)
Head on	0	0	1	0	2	3 (3%)

Initial Crash Screening Summary

Based upon the results of the initial crash analysis and screening, the following can be stated regarding the crash experience within the study area:

- Crash experience from 2015-2019 is comparable with 2018 and 2019 being the years with the higher crash experience.
- The most common crash occurs on clear days during daylight hours on dry pavement.
- Crash trends indicate an increase in wet weather crashes which may indicate worn or polished pavement since the roadway surface is near the end of its service life.
- The most common causes of crashes are distracted driving (17%), failed to yield ROW (13%), followed too close (13%).
- The most common type of crash is rear end (36%) and roadway departure (18%).
- Segments A & B experience the highest number of crashes.

Crash Countermeasures

Recommended Countermeasures

There appears to be two primary crash patterns experienced within the study area. The primary crash patterns appear to be a rear-end and angle crash patterns. The crashes primarily occur at the following locations:

- County Road 52
- Kelly Drive (South)
- Chatham Court
- High Crest Road

The secondary crash pattern is related to distracted driving crashes. The pattern can be further analyzed to reveal a roadway departure pattern and a rear-end pattern. The primary locations these crashes occur are as follows:

- County Road 52
- Deer Springs Road to Kelly Drive (North)
- High Crest Road to Oak Forest Way
- Parsons Drive to Grey Oaks Parkway

To address the crash patterns the following crash countermeasures are recommended:

1. Install centerline rumble strips from County Road 52 to County Road 36.
2. Install edge line rumble strips from County Road 52 to County Road 36.
3. Install a left turn lane at the following locations:
 - a. Chatham Court
 - b. High Crest Road
4. Coordinate with private property owner(s) to trim trees to provide proper sight distance at Kelly Drive (South).

The following includes details of the crash countermeasure recommendations.

Edge Line/Centerline Rumble Strips

Rumble strips are recommended to address the crash experience along the study area. The rumble strips are recommended for both the edge line of the roadway and the centerline. An alternate layout for the edge line rumble strips is recommended for consideration. The standard ALDOT approved rumble strips should be modified to provide a smaller strip that's closer to the edge line traffic stripe. The smaller rumble strip located closer to the edge line traffic stripe should allow for additional room on the shoulder for cyclists. The detail shown in Figure 5 illustrates the recommended rumble strip.

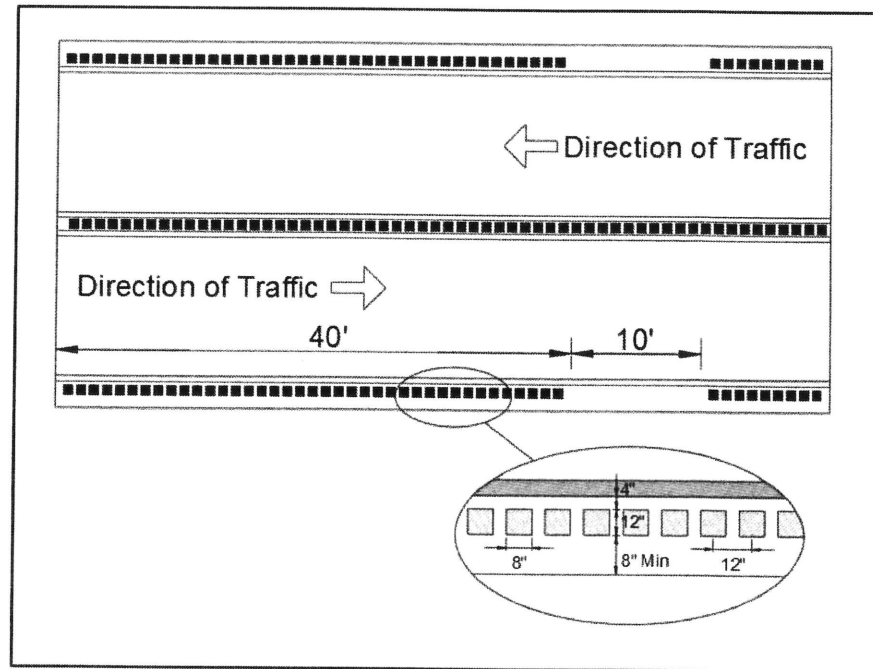


Figure 5 – Rumble Strip Detail

Summary and Conclusions

Based upon the information in this report the following can be stated:

1. The study area of this roadway safety evaluation is Shelby County Highway 11 from Shelby County Road 52 to Shelby County Road 36.
2. There were approximately 102 crashes that occurred during the years studied (2015-2019).
3. The yearly crash experience from 2015-2019 is comparable with 2018 and 2019 being the years with the higher crash experience.
4. The most common crash occurs on clear days during daylight hours on dry pavement.
5. Crash trends indicate an increase in wet weather crashes which may indicate worn or polished pavement since the roadway surface is near the end of its service life.
6. The most common causes of crashes are distracted driving (17%), failed to yield ROW (13%), followed too close (13%).
7. The most common types of crashes are rear end (36%) and roadway departure (18%).
8. Segments A (Shelby County Highway 11 from Hwy 52 to Chatham Court) & B (Shelby County Highway 11 from Chatham Court to Woodridge Circle) experience the highest number of crashes.
9. The following crash countermeasures are recommended for the study area:
 - a. Install centerline rumble strips from County Road 52 to County Road 36.
 - b. Install edge line rumble strips from County Road 52 to County Road 36.
 - c. Install a left turn lane at the following locations:
 - i. Chatham Court
 - ii. High Crest Road
 - d. Coordinate with private property owner(s) to trim trees to provide proper sight distance at Kelly Drive (South)